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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/801,394

03/15/2004

Ozgur Sahin

STF-S02-045

1677

32566

7590

09/23/2004

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EXAMINER

RAEVIS, ROBERT R

ART UNIT

PAPER NUMBER

2856

DATE MAILED: 09/23/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

**Application No.**

10/801,394

**Applicant(s)**

SAHIN ET AL.

**Examiner**

Robert R. Raevis

**Art Unit**

2856

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 24 August 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-51 is/are pending in the application.
- 4a) Of the above claim(s) 32-51 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-31 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 3-15-04.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

### DETAILED ACTION

Election of Group I is acknowledged.

Figures 1 and 2 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.121(d)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(f) he did not himself invent the subject matter sought to be patented.

Claims 1-7,9,11-17,19-28,30,31 are rejected under 35 U.S.C. 102(a) as being anticipated by Sahin et al ("HARMONIC CANTILEVERS FOR NANOMECHANICAL SENSING OF ELASTIC PROPERTIES", listed on PTO-1449).

Sahin et al teach (Figures 1, 5; ABSTRACT and p. 1126, left hand col., top paragraph) a cantilever that employs "removing mass from regions" to tune the

resonance frequency to achieve a "integer multiple" of the fundamental resonance frequency. The cited reference includes many authors not included as inventors of this subject application.

Claims 8,10,23-27,29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sahin et al ("HARMONIC CANTILEVERS FOR NANOMECHANICAL SENSING OF ELASTIC PROPERTIES", listed on PTO-1449).

As to claims 8,10,23-27,29, it would have been obvious to employ a diamond coating material for Sahin's tip as diamond coatings are known in AFM to allow for a more durable tip. Adding a coating necessarily changes a dimension of the arm.

Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sahin et al ("HARMONIC CANTILEVERS FOR NANOMECHANICAL SENSING OF ELASTIC PROPERTIES", listed on PTO-1449) as applied against claim 15 above, and further in view of Kirk et al.

As to claim 18, it would have been obvious to employ notches on Sahin's cantilever as Kirk et al teach (Figure 10) use of notches 91 to control the level of bending of cantilevers in scanning probe microscopes.

Claims 1-4,6,8,10,11,30,12,13,23-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's Admission in view of Bagley et al

Applicants describe (Figures 1,2; and pages 1-3) an AFM that employs a cantilever that is vibrated "close to one of its flexural resonances, typically the fundamental resonance frequency" (p. 2, lines 8-12); but does not refer to an "integer

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number", or clearly state that that shape is "selected" to tune the fundamental frequency.

As to claims 1-4,6,8,10,11,30,12,13,23-29, it would have been obvious that Applicant's described cantilever has a shape that provides for higher resonant frequencies being an integer multiple of a first resonant frequency as Bagley teaches (col. 1, lines 30-35) that cantilevers retain an "integer multiple" (col. 1, line 32) relationship. In addition, it would have been obvious to select a shape for a cantilever in an AFM as AFM's generally employ a long and narrow cantilevers to provide for accurate surface measuring.

As to claims 6,8,10,11,30,12,13,23-29, it would have been obvious to employ a diamond coating material for Applicant's tip as diamond coatings are known in AFM to allow for a more durable tip. Adding a coating necessarily changes a dimension/mass of the arm.

Claims 5,31,15-17,19,21,22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's Admission in view of Bagley et al as called for in claim 4, and further in view of Fretigny et al.

As to claims 5,31,15-17,19,21,22 it would have been obvious it would have been obvious to employ a tapered/V shaped cantilever end region with hole in the cantilever as Fretigny teaches (Figure 3) use of a tapered shape cantilever 2 to provide for a sensitive holder for an AFM tip 1.

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Claims 7,9,11,30,12-14,11,15-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's Admission in view of Bagley et al as applied against claim 6 above, and further in view of Kirk et al.

As to claims 11,15-22, it would have been obvious to employ notches on Sahin's cantilever as Kirk et al teach (Figure 10) use of notches 91 to control the level of bending of cantilevers in scanning probe microscopes.

As to claims 7,9,11,30,12-15-17, it would have been obvious to employ a region of reduced dimensions as Kirk et al teach (col. 11, lines 8-31) use of etching to reduce dimensions/mass of a cantilever to vary sensitivity of a cantilever probe.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Robert R. Raevis whose telephone number is 571-272-2204. The examiner can normally be reached on Monday to Friday from 6:30am to 4pm. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

*Raevis*

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